

Notes on a Collection of Orchids from Ponape, Caroline Islands¹

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THE CAROLINE ISLANDS of the Micronesian area of the Pacific, which extend in an approximately east-west direction for some 1,950 miles, between about 5° and 10° north latitude, are almost directly north of New Guinea, the Bismarck Archipelago, and the Solomon Islands, the center of distribution for the family Orchidaceae. It is, therefore, to be anticipated that the orchid flora of the Carolines is fairly extensive; such is indeed the case, though our knowledge of the flora of the area is still somewhat incomplete. The novelties incorporated in the present paper indicate that further exploration in the Carolines will doubtless increase the numbers known in the orchidaceous flora of the islands.

The present interesting collection of Orchidaceae from Ponape was assembled by Philip A. Adams, while engaged in entomological surveys of the island.³ The materials, consisting of both herbarium and living specimens, were sent to the Botanical Garden of the University of California at Berkeley at the instigation of Dr. T. Harper Goodspeed. The writer must thank him for permission to study the collection, and for reading and checking the paper in its final stages. His further thanks go to Dr. Lincoln Constance for assistance in taxonomic problems and for supervising the work in progress; and to Dr. Rimo Bacigalupi for assistance with the Latin diagnoses.

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BULBOPHYLLUM Thouars

Orch. Îles Afr., Tabl. des Espéc. 3, et Icon., tt. 93-97, 1822.

Eight or nine species of this gigantic and highly complex genus are now known from the Carolines. The group would greatly profit by critical revision in the area.

Bulbophyllum Gibbonianum Schltr., Engl. Bot. Jahrb. 56: 483, 1920. (§ *Scyphosepalum*)

Mt. Sankaku, 1,100 ft. alt.: this species grows on tree trunks, fallen logs, mossy rocks and soil. Especially healthy plants were on rotten logs and bases of Bird's Nest Ferns (*Asplenium nidus* L.). The flower is eggplant purple. The species was seen nowhere but on the summit of Mt. Sankaku. August, 1950, P. A. Adams 24.

This attractive dwarf epiphyte was originally described from specimens collected by C. Ledermann on the island of Babelthuap in the Palau group. Our plant is rather larger in all parts than the type material, and differs in floral color, the blossoms as described by Schlechter being noted as "rotbraun, mit braungelber Lippe." It has not been reported previously from Ponape. The only other species of the section *Scyphosepalum* is the New Guinean *B. nuruanum* Schltr. Living material is in cultivation at the Botanical Garden of the University of California at Berkeley.

Bulbophyllum micronesiacum Schltr., Engl. Bot. Jahrb. 56: 482, 1920. (§ *Dialeipanthé*)

Mt. Beirut, 2,200 ft. alt.: epiphytic, common in primary forest from about 1,500 ft.

Petals greenish white, pink at bases. Spur of chin deep red. August, 1950, *P. A. Adams* 16; Mt. Kubersoh, 2,000 ft. alt.: on base of Bird's Nest Fern. August, 1950, *P. A. Adams* 22.

Bulbophyllum micronesiacum Schltr. is also known from Yap and Rota, and from Babelthuap in the Palaus. It is a very distinctive and handsome large-flowered species allied to *B. guamense* Ames from the Marianas. Living material is in cultivation at the Botanical Garden of the University of California at Berkeley.

Bulbophyllum urceolatum A. D. Hawkes, sp. nov. (Fig. 1)

Herba epiphytica nana repens. Rhizoma repens, cylindricum. Pseudobulbi ascendentes arcuati semi-erective, ovoidei usque ad cylindrico-ovoides, leviter angulati, diphylli. Folia 2, id interiorum insigniter parvius ac minus evolutum, erecta arcuata, coriacea, ovato-lanceolata usque ad oblongo-lanceolata, plus minusve carinate apiculata vel oblique bilobata, basi angustiora conduplicata. Inflorescentia verisimiliter terminalis, erecto-arcuata, uniflora; rachis leviter angularis. Flores solitarii, erecto-arcuati, urceolati, coriacei. Sepala basi coherentia apice ecurvata, triangulari-lanceolata triangulari-ovata, acuta, marginibus patrum liberarum leviter introrsis; lateralibus basi mentum rotundum truncatum formantia, prominente carinata. Petala sepalis aequilonga, lineari-lanceolata, infra medium abrupte expansa, acuta, apice ecurvata, basi truncata. Labellum semitransparens, textura tenuissima, immotum, expansum obovatum, basi unguiculatum, subacutum, ecallosum, prope basin saccum truncatum formans, margine laterali leviter incurva, disco lineas irregulares longitudinales aliquanto impressas ferente.

Dwarf creeping epiphytic herb. Rhizome repent, 2–3 mm. in diameter, more or less covered with somewhat leathery, brown sheaths, giving off pseudobulbs at intervals, mostly cylindrical. Roots filiform, flexuose,

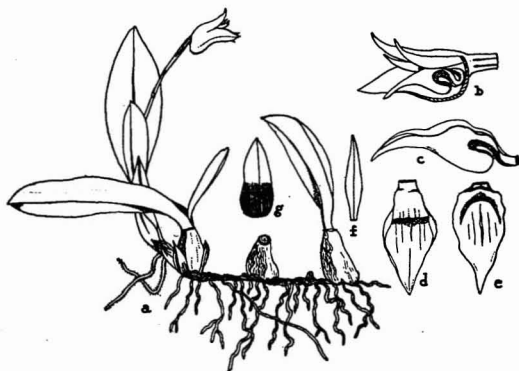


FIG. 1. *Bulbophyllum urceolatum* A. D. Hawkes, sp. nov. a, Habit, $\times 1$; b, flower, lateral view, one lateral sepal removed, $\times 2.5$; c, labellum, lateral view, $\times 5$; d, labellum, dorsal view, $\times 4$; e, labellum, ventral view, $\times 4$; f, petal, $\times 5$; g, lateral sepal, $\times 2.5$.

brown or reddish-maroon, distinctly villous when young, later glabrous. Pseudobulbs produced at intervals, 2–12 mm. apart, ascending, somewhat arcuate or semi-erect, ovoid to cylindrical-ovoid, often vaguely angular (especially when young), wrinkled when old, 12–15 mm. long, 6–8 mm. in diameter near base, narrowing above, diphyllous; basal sheaths usually geminate, caducous, scarious, triangular-lanceolate, acuminate, about 1 cm. long and about 8 mm. broad basally. Leaves 2 (one often caducous), the inner one much smaller and less developed, erect or arcuate, leathery, light green, ovate-lanceolate to oblong-lanceolate, more or less carinately apiculate to obliquely bilobate, narrowed and conduplicate basally, 4–7.5 cm. long, 8.5–16 mm. broad at widest point; secondary leaf less coriaceous in texture, carinately apiculate, rather conduplicate, oblong-lanceolate to ovate-lanceolate, about 2.5–3 cm. long, about 5–7.5 mm. broad. Inflorescence apparently terminal, erect-arcuate, 1-flowered, to about 4 cm. long; rachis vaguely angular, about 1 mm. in diameter, tinged with vermilion above the bract, green below; bract solitary, clasping basally, submembranaceous, triangular-lanceolate, long-acute, about 2 mm. long. Flower solitary, erect-arcuate, urceolate, coriaceous, the sepals

and petals flaring somewhat in apical half, odorless, 11 mm. long, about 5 mm. broad, basal half vermilion, apical half canary yellow. Sepals similar, thick, coherent for about half of length (the laterals slightly more), flaring apically, triangular-lanceolate or ovate-triangular, acute, the margins of the free portion slightly introrse, about 10.5×3 mm.; laterals at base forming a rotund-truncate mentum about 3 mm. long, rather prominently carinate. Petals almost as long as sepals, about 1 mm. wide, linear-lanceolate, with a slight, rather abrupt expansion just below the middle, acute, the apex curved outward, truncate basally. Labellum very thin in texture, almost transparent, 8×3 mm., non-mobile, entire, obovate when expanded, unguiculate basally, acutish, expanded into a rather truncate sac near base which projects half-way under the unguiculate, ecallose, with irregular, somewhat impressed longitudinal lines along the disc, lateral margins somewhat incurved.

Mt. Beirut, 2,200 ft. alt.: on trees with #9 (*Bulbophyllum* sp.). Flowers of this species not seen, but I am told that they are pale orange with green-tipped petals, arising singly from the tips of the pseudobulbs. August, 1950, P.A. Adams 10, TYPE, flowering under cultivation at the Botanical Garden of the University of California, and deposited as a pickled specimen in the Herbarium of this institution.

This handsome little epiphyte is not allied to any species of *Bulbophyllum* known to the writer. Its labellar structure, coupled with the unique conformation of the flowers, appears unique in the genus.

Bulbophyllum sp.

Mt. Beirut, 2,200 ft. alt.: on dwarf trees with #10 (*Bulbophyllum* sp.), #7 (*Diplocaulobium carolinense* A. D. Hawkes), #5 (*Dendrobium nanarauticum* Fukuyama), #16 (*Bulbophyllum micronesiacum* Schltr.). Flower not seen. August, 1950, P. A. Adams 9. A sterile specimen, with living material in our collections.

DENDROBIUM Swartz

Soc. Sci. Uppsala, Nova Act. 6: 82, 1799.

This is the largest genus in the Caroline orchid flora, with 15 or 16 species now known from the area.

Dendrobium Adamsii A. D. Hawkes, sp. nov.
(§ *Grastidium*)

Herba epiphytica verisimiliter elongata. Caulis (in specimina mihi visa imperfectus) 12 cm. longus, 2.5–3.5 mm. latus, leviter arcuatus, luteus, vaginis foliorum arcte obtectus, complanatus. Folia numerosa, coriacea, 5–5.5 cm. longa, usque ad 8–10 mm. lata, oblongo-lanceolata, apicibus angustioribus ensiformi-linearibus, emarginatus vel oblique bilobatis, basi obscure conduplicata. Pedunculi abbreviati, ca. 3 mm. longi, bracteis paucis obtusis obtecti. Flores solitarii vel 2-ni, membranacei, 1.5 cm. longi, campanulati. Sepala lineari-lanceolata, 12 mm. longa, 1.5 mm. lata, acuta, lateralia margine anteriore basi dilatata cum pede columnae mentum triangulum vel rotundo-triangulum obtusumque formantia. Petala sepalis lateralibus similaria lineari-lanceolata, apice obtusa. Labellum parvum, trilobatum, apice recurvatum; lobis lateralibus erectis, triangularis, margine anteriore dentatis; lobo intermedio cuneato-oblongo, papilloso, apice acuminato quasi caudato. Columna brevis, quasi quadrata.

Epiphytic herb, in our specimen incomplete, apparently rather elongate. Stem (incomplete) 12 cm. long, 2.5–3.5 mm. thick, rather arcuate, yellowish, vaguely zigzag, virtually covered by persistent sheathing leaf bases, complanate, the leaf bases mostly about 1.5 cm. long, obscurely articulate. Leaves numerous, rather coriaceous, 5–5.5 cm. long, 8–10 mm. wide at broadest point, oblong-lanceolate, narrowing rather abruptly toward the much narrower ensiform-linear apical portion, which is deeply emarginate or obliquely bilobate, basally somewhat conduplicate. Peduncles abbreviated, about 3 mm. long, almost as broad, covered with a

few obtuse bracts. Flowers solitary or paired, rather membranaceous when dry, "pale green, petals pinkish inside, labellum with purplish-red median mark inside, very fragrant, wilt after about 6 hours" [*vide* collector], 1.5 cm. long, campanulate, borne on vaguely arcuate rather robust pedicellate ovaries about 8 mm. long. Dorsal sepal linear-lanceolate, acute, 12 mm. long and 1.5 mm. broad. Lateral sepals oblique, basally connate into a large, angular, compressed mentum that is triangular-rotund and obtuse in shape, about 6 mm. long and 3 mm. deep; lamina linear-ligulate or ovate-ligulate, truncate or obtuse, about 12 mm. long and 1 mm. wide. Petals similar in size and shape to lateral sepals but more lanceolate basally, obtuse apically. Lip small, the tip recurved, about 5 mm. long and 1.5 mm. broad, prominently trilobate; lateral lobes erect, triangular, forward-slanting, the anterior margin strongly dentate; midlobe cuneate-oblong, covered with a dense growth of apiculate papillae, the apex acuminate and almost caudate. Column 0.5 mm. long, almost as wide, semiquadrate; foot large.

Mt. Kubersoh, 2,000 ft. alt.: on mossy tree trunks, flowers pale green, petals pinkish inside, labellum with purplish-red median mark inside; blooms very fragrant, wilt after about 6 hours. August, 1950, *P. A. Adams* 19, TYPE, deposited in the Herbarium of the University of California at Berkeley (916873).

This is a rather handsome species of § *Grastidium*, whose closest alliance in the Caroline orchid flora is with *Dendrobium implicatum* Fukuyama, *D. patenti-filiforme* Hosokawa, and *D. ponapense* Schltr.; it also exhibits some affinity with the Moluccan *D. pruinatum* Teijsm. & Binn. It differs from *D. implicatum*, its nearest relative, in its more plane lateral sepals, the dimensions of the mentum, the size and general aspect of the flowers, and the more robust vegetative habit. Living material of the novelty, which I take pleasure in naming for its collector, is in cultivation in the Botanical Garden of the University of California at Berkeley.

Dendrobium carolinense Schltr., Engl. Bot. Jahrb. 56: 472, 1920. (§ *Grastidium*)

Mt. Kubersoh, 1,200 ft. alt.: on dead tree trunk with Bird's Nest Fern. Flowers pale golden yellow with bright orange median mark on inside of white labellum. August, 1950, *P. A. Adams* 18. A very handsome epiphyte, known now from Kusaie, Truk, and Ponape, where it appears to be rather widespread in its occurrence.

Dendrobium implicatum Fukuyama, Bot. Mag. [Tokyo] 51: 901, fig. 2, 1937. (§ *Grastidium*)

Mt. Tolotom, 1,700 ft. alt.: on trunk of hardwood, flower pale pink with darker maculations, August, 1950, *P. A. Adams* 3; Mt. Tolenkiup, 1,700 ft. alt.: epiphyte, flower pale green. August, 1950, *P. A. Adams* 13.

The type specimen of *Dendrobium implicatum* Fukuyama was collected by T. Hosokawa in the Palau Islands, with the comment "in parinarietis." Our present material from Ponape is fragmentary, but the plants appear to be much smaller in all parts than the type (e.g., *Adams* 13 has flowers which measure only about 2 cm. long, whereas the lateral sepals of *Hosokawa* 7275 reach a length of 4-4.5 cm.). Living material is being grown in our collections.

Dendrobium nanarauticum Fukuyama, Bot. Mag. [Tokyo] 51: 900, fig. 1, 1937. (§ *Oxyglossum*)

Mt. Tolotom, 2,100 ft. alt.: on mossy trees with #1 (*Dendrobium violaceo-miniatum* Schltr.) and #4 (*Geissanthera Hosokawae* (Fukuyama) A. D. Hawkes), also common on the summit of Mt. Beirut. August, 1950, *P. A. Adams* 5; Mt. Kubersoh, 2,000 ft. alt.: same sp. as #5, on mossy trees. August, 1950, *P. A. Adams* 23.

This is an attractive, very dwarfed epiphyte which at first inspection appears to be a species of *Bulbophyllum* Thou. The section *Oxyglossum* is predominantly New Guinean in

distribution, with about 25 species native on that island; the present plant is apparently closest to *D. coerulescens* Schltr. The type specimen (Hosokawa 6003) was collected on the Ponapean Mt. Nanaraut (=Nanalaut) at an elevation of 680 meters.

***Dendrobium ponapense* Schltr., Engl. Bot. Jahrb. 56: 471, 1920. (§ *Grastidium*)**

Mt. Sankaku, 1,100 ft. alt.: on tree trunks, hanging from Bird's Nest Ferns, etc. The older plants all had an accumulation of organic material in the roots; epiphytic; bloom white, inside of labellum violet with pale median orange stripe. The showiest *Dendrobium* encountered. August, 1950, *P. A. Adams* 29.

The type of this handsome epiphyte was collected by Ledermann on the island of Ponape, "ohne nähere Angaben." It is allied to the new *Dendrobium Adamsii* A. D. Hawkes (supra), *D. implicatum* Fukuyama and *D. pruinatum* Teijsm. & Binn. Our specimen, though incomplete, appears to match rather well the type description by Schlechter. Living material is in cultivation at the Botanical Garden of the University of California at Berkeley.

***Dendrobium violaceo-miniatum* Schltr., Engl. Bot. Jahrb. 56: 470, 1920. (§ *Oxyglossum*)**

Mt. Tolotom, 2,100 ft. alt.: on trunk of *Hibiscus tiliaceus*, perianth blue, tip of lip brownish-orange; common throughout the primary forest from 1,300 ft. up; does best in open, sunny areas. August, 1950, *P. A. Adams* 1; Mt. Kubersoh, 2,000 ft. alt.: same sp. as #1, but flower white. August, 1950, *P. A. Adams* 21.

This, the second species of section *Oxyglossum* present in the collection, is a very handsome and unusual dwarf plant, reminiscent of a *Bulbophyllum* Thou. or *Eria* Ldl. in superficial vegetative habit. It is allied to *Dendrobium lapeyrousioides* Schltr. from Kaiser-

Wilhelmsland, New Guinea. The type specimen (*C. Ledermann* 13415) was collected "in niedrigem Buschwald, bei Patapat (=Poto-pot), auf Ponape, 200 bis 300 m ü. M." Living material is in our collections at this time.

***Dendrobium* spp.**

Mt. Beirut, 2,200 ft. alt.: epiphyte, flowers not seen. August, 1950, *P. A. Adams* 12. This sterile specimen, of which living material is in cultivation at the Botanical Garden of the University of California, is perhaps referable to *Dendrobium implicatum* Fukuyama.

Palakir: ½ mile south of Airfield No. 2, on hardwood, in deep shade. Flower not seen. August, 1950, *P. A. Adams* 14. Only an indeterminate sterile fragment is present.

Forty-five minutes up trail from Nanpil to Tolenkup: on fallen tree with #8 (*Sarcanthinae*, sterile), epiphytic, same sp. as #14 (*Dendrobium* sp.). August, 1950, *P. A. Adams* 15. Living material of this orchid is in the Botanical Garden of the University of California.

Mt. Sankaku, 1,100 ft. alt.: on bare tree trunks, blooms not seen. August, 1950, *P. A. Adams* 25. Only an indeterminate sterile fragment is present. Living material is in our collections:

DIPLOCAULOBIMUM (Reichenbach filius) Kraenzlin

In Engl., *Pflanzenr.* 4, 50, ii, B, 21: 331, 1910.

Three species of this very interesting dendroboid genus are now known from the Carolines, one of which is apparently new.

***Diplocaulobium carolinense* A. D. Hawkes, sp. nov.**

Herba parva epiphytica, caespitosa. Rhizoma breve, repens, cataphyllis obiecta. Pseudobulbi erecti, in sicco lutei, 6–13 cm. longi, basi 3–5 mm. lati, apice 2.5–3 mm. lati, basi ovoideo-attenuati, ad apicem versus elongato-

ligulati ancipitique, monophylli. Folium erectum, planum, coriaceum, ca. 6.5–8 cm. longum, 8–9.5 mm. latum, leviter undulatum, lineari-ligulatum usque ad oblongo-ligulatum, apice profunde emarginatum. Spatha ensiformis, scariosa, ca. 2 cm. longa, 2.5–3 mm. lata. Flores solitarii vel pauci, fugaces, ca. 4.5 cm. diametientes. Sepala lineari-lanceolata, longe-caudata, 5-nervosa, lateralia cum pede columnae mentum obtusum triangulum formantia. Petala filiformia, longe-caudata, basi paululum expansa. Labellum 9 mm. longum, 1.5–4.5 mm. latum, ad basim longe-unguiculatum; lobis lateralibus erectis, elongato-triangularis, obtusis truncatisve, nervosis; lobo intermedio magno, basi oblongo, apice patente, ellipsoideo, margine undulato crispatoque, obscure 3-lamellato papillosoque. Columna brevis, obtusa.

Small epiphyte in sunny places of primary forest, clustered. Rhizome abbreviated, repent, covered with sheathing scarious cataphylls. Pseudobulbs erect, yellowish when dry, 6–13 cm. long, 3–5 mm. thick basally, narrowing to 2.5–3 mm. apically, ovoid-attenuate basally, narrowing above to an ancipitous ligulate prolongation, at or near the apex of which the solitary leaf and large floral sheath are produced. Leaf erect, plane, coriaceous, about 6.5–8 cm. long, 8–9.5 mm. wide, vaguely undulate, linear-ligulate to oblong-ligulate, distinctly and deeply emarginate at apex, slightly conduplicate at base. Floral sheath ensiform, scarious, about 2 cm. long, 2.5–3 mm. wide. Pedicellate ovary arcuate, filiform, about 2.5 cm. long, less than 1 mm. thick. Flowers "greenish-white with pink on inside of tube" (*vide* collector), solitary, paired or few, successive, fugacious, about 4.5 cm. in diameter. Dorsal sepal about 2 cm. long, 1 mm. wide basally, narrowing to 0.25 mm. near apex, erect, twisted, 5-nervose. Lateral sepals similar in shape and size, about 2 mm. wide basally, spreading or down-curved, forming a triangular, obtuse mentum with the column-foot which is 4.5 mm. deep, the margins involute. Petals about 1 cm.

long, 0.25 mm. or less wide, filiform, long-caudate, slightly broader basally. Lip 9 mm. long, 1.5–4.5 mm. broad when expanded, long unguiculate basally; lateral lobes erect at sides of column, deep purple when dry, elongate-triangular, obtuse or truncate, prominently nervose; midlobe very large, white suffused with pale yellow and with a deep purple area and venation near base which extends toward apex, basally oblong, enlarging into a spreading ellipsoidal portion with undulate and crisped margins at apex; median disc obscurely 3-lamellate and more or less furnished with clavellate papillae. Column 2.5 mm. long, blunt, with a foot; anther yellow when dry.

Mt. Beirut, 2,200 ft. alt.: on tree trunks in open, sunny places; abundant throughout the primary forest; flowers greenish-white with pink on inside of tube. August, 1950, *P. A. Adams* 7, TYPE, deposited in the Herbarium of the University of California at Berkeley (916872); Mt. Sankaku, 1,100 ft. alt.: on tree trunk, same sp. as #7. August, 1950, *P. A. Adams* 30. A sterile specimen, with living material growing in the Botanical Garden collections, obviously referable to this species.

This attractive dwarf *Diplocaulobium* is apparently closest to *D. nitidissimum* (Rchb.f.) Kraenzl., the type species of the genus and a native of the Admiralty Islands, the Solomon Islands, and New Ireland. The present plant differs materially from that species, however, in its rather larger dimensions in all parts, the shape of the labellum and other floral parts, and vegetative characters. Living material of this interesting addition to the Caroline orchid flora is in cultivation at the University of California.

Diplocaulobium elongaticolle (Schltr.) A. D. Hawkes, comb. nov.

Dendrobium elongaticolle Schltr., Engl. Bot. Jahrb. 56: 465, 1920.

A native of Koror and Babelthuap Islands in the Palaus, and of Yap.

Diplocaulobium flavicolle (Schltr.) A. D. Hawkes, comb. nov.

Dendrobium flavicolle Schltr. Engl. Bot. Jahrb. 56: 466, 1920.

Endemic on Ponape, having been discovered by Ledermann near Patapat (= Poto-pot) in 1913.

GEISSANTHERA Schlechter

In K. Schumann & Lauterbach, *Nachtr. Fl. Deutsch Südsee* 231, 1905.

The orchidaceous genus *Geissanthera* was established by Rudolph Schlechter in 1905 (*op. cit.*), the type species, *G. papuana*, having been collected in British New Guinea. In his revision of the Orchidaceae of New Guinea (1914) he reduced this genus to subgeneric status in *Microtatorchis* Schltr., making the type *M. papuana* (Schltr.) Schltr. Louis O. Williams reviewed certain species of the closely allied aggregation *Taeniophyllum* Bl. some years later (1939: 147) and came to the conclusion that *Geissanthera* should be placed in that polymorphic alliance, again as a sub-genus. It is the opinion of the present writer that *Geissanthera* Schltr. constitutes a distinct generic entity, as was originally established by Schlechter.

P. A. Adams 4 is referable to *Microtatorchis Hosokawae* Fukuyama. The species was assigned by Fukuyama in his original diagnosis (1937: 903) to the section *Geissanthera* (Schltr.) Schltr. Inspection of this Ponapean endemic seems to indicate, however, that it is too aberrant in several diagnostic characters to warrant its retention in *Microtatorchis* Schltr.; it does, furthermore, agree in structure with *Geissanthera* Schltr., as it was initially described.

Microtatorchis Schltr. is a rather polymorphic group of predominantly epiphytic monopodial sarcanthad orchids with either leafy or aphyllous stems, very shortened inflorescences, and paired pollinia. *Geissanthera* Schltr. is distinguished with facility by the presence of large or small bracteoles on the

inflorescence (virtually a unique character in the Orchidaceae), the proportionately large blossoms, and the bibrachiate clinandrium of the column. *Taeniophyllum* Bl., with which both of these entities have been confused, is now considered to include those totally aphyllous plants with four distinct pollinia and elongate, mostly filiform inflorescences, which are not bracteolate. The following dichotomous key will assist in the differentiation of the three genera involved:

1. Pollinia 4; plants totally aphyllous; inflorescences (at least the peduncles) proportionately elongate. *Taeniophyllum* Bl.
- Pollinia 2; plants aphyllous or more or less leafy; inflorescences elongate or short. 2
2. Inflorescences furnished with more or less prominent foliose bracteoles; clinandrium bibrachiate. *Geissanthera* Schltr.
- Inflorescences bracteate, not furnished with bracteoles; clinandrium monobrachiate. *Microtatorchis* Schltr.

The Ponapean species must be transferred to *Geissanthera*.

Geissanthera Hosokawae (Fukuyama) A. D. Hawkes, comb. nov.

Microtatorchis Hosokawae Fukuyama, Bot. Mag. [Tokyo] 51: 903, figs. 4, 5, 1937.

Taeniophyllum Hosokawae L. O. Wms., Harvard Univ., Bot. Mus. Leaflet 7: 147, 1939. Mt. Tolotom, 2,100 ft. alt.: on mossy trees, associated with #1 (*Dendrobium violaceo-miniatum* Schltr.) and #5 (*Dendrobium nanarauticum* Fukuyama). August, 1950, *P. A. Adams* 4.

The original specimen was collected by T. Hosokawa on Mt. Nanaraut (= Nanalaut), at about 500 meters altitude. The species is apparently restricted to Ponape in its distribution.

Geissanthera Schltr. reaches its greatest de-

velopment in the montane regions of New Guinea, where about 14 species are known. Outlying representatives occur, in addition to the Caroline Island plant noted above, in Samoa and in the Philippines. All of the remaining species, except the typical *Geissanthera papuana* Schltr., have been described under *Microtatorchis* Schltr., and will need eventual transferral to the present group.

MOERENHOUTIA Blume

Orch. Archip. Ind. 99, tt. 28, 42, 1858.

The physurid genus *Moerenhoutia* Bl. is represented in the Carolines by four species, the present one being highly variable and with several apparently distinct varietal forms described.

Moerenhoutia leucantha Schltr., Engl.
Bot. Jahrb. 56: 450, 1920.

Mt. Tolenkup, 1,200 ft. alt.: in dense shade in very wet leaf mold of forest floor. Flowers white, terrestrial. August, 1950, *P. A. Adams* 6. Living material of this collection is in cultivation in our Botanical Garden.

The species is endemic on Ponape, and is closest in alliance with the New Guinean *Moerenhoutia constricta* J. J. Sm. and *M. lamellata* Schltr.

OBERONIA Lindley

Gen. & Sp. Orch., Pl. 15, 1830.

An exceedingly technical and difficult genus of paleotropical epiphytes, with two species present in the Adams collections.

Oberonia Hosokawae Fukuyama, Nat. Hist. Soc. Formosa, Trans. 31: 290, 1941.

Mt. Sankaku, 1,100 ft. alt.: with #26 (*Phreatia ladronica* Tuyama), epiphytic, bloom not seen. August, 1950, *P. A. Adams* 27.

A member of the section *Scytoxiphium*, and one of the less attractive members of the genus, probably bearing pellucid-white or pale green flowers about 3 mm. in diameter.

Oberonia ponapensis Tuyama, Bot. Mag. [Tokyo] 54: 275, 1940.

Mt. Tolotom, 2,100 ft. alt.: epiphytic, inflorescence rusty red. August, 1950, *P. A. Adams* 17.

An interesting dwarf member of section *Otoglossum*, apparently endemic on Ponape. The very numerous flowers measure 1 mm. or less in diameter, and when dry are an attractive orange hue.

PHAIUS Loureiro

Fl. Cochinch. 529, 1790.

A single species of this genus is known to date from the Carolines. The original material of the present species in the area was gathered by Ledermann on Ponape, near Patapat (= Potopot) and Paue (= Poaipoai).

Phaius amboinensis Bl., Mus. Bot. Lugd.-Bat. 2: 180, 1856.

Mt. Tolotom, 1,900 ft. alt.: terrestrial, in wet loam with much leaf mold, in deep shade. Abundant from about 1,500 ft. alt. up to summit. Flower pure white with creamy yellow tube. August, 1950, *P. A. Adams* 11. A handsome species, of considerable horticultural value.

PHREATIA Lindley

Gen. & Sp. Orch. Pl. 63, 1830.

With the interesting plant described here as new, the total number of Phreatias known to occur in the Caroline Islands reaches 10. The others are *Phreatia palawensis* (Schltr.) Tuyama, *P. pseudo-Thompsonii* Tuyama, *P. kusaiensis* Tuyama, *P. pacifica* Fukuyama, *P. Kanehirae* Fukuyama, *P. Thompsonii* Ames, *P. carolinensis* Schltr., *P. ladronica* Tuyama, and *P. ponapensis* Schltr. The genus is a large and exceedingly complex one, and stands sorely in need of critical revision.

Phreatia Goodspeediana A. D. Hawkes, sp. nov. (§ *Euphreatia*)

Herba parva epiphytica caespitosa, usque ad 6.5 cm. alta. Rhizoma abbreviatissima, cataphyllis scariosis oblecta. Caules fere deficientes. Folia parva, 4.5–6.5 cm. longa, 3–4.5 mm. lata, rigide erecta, coriacea, lineari-ligulata, obtusa vel apiculata, inaequaliter bilobata, basi pseudopetiolata articulata, vagina ca. 6 mm. longa, 3–3.5 mm. lata, scariosa, conduplicata. Inflorescentia 5 cm. longa, lateralis, erecta, apice valde reflexa, secunda, apice racemosa. Bractae erectae, 5 mm. longae, basi 1 mm. latae, lineari-ensiformae, longe-acuminatae, apice leviter tortuosae. Flores 1 mm. longi, numerosi, fragili. Sepalum dorsale ovatum, acuminatum, 1 mm. longum, 0.25 mm. latum. Sepala lateralia ovato-elliptica usque ad obovata, acuminata, 1 mm. longa, ca. 0.5 mm. lata. Petala ovata, acuto-acuminata, leviter inflecta, 0.25 mm. longa, insigniter minus lata. Labellum 1.25 mm. longum, ca. 0.75 mm. latum expansum, obscure trilobulatum, oblongo-ellipticum, obtuso-apiculatum, disco leviter crasso.

Dwarf caespitose epiphytic herb to 6.5 cm. tall when in flower. Rhizome very abbreviated, obscured by sheathing scarious deteriorating bracts and copious flexuose slender roots. Stems mostly absent. Leaves few (6 in our specimen), 4.5–6.5 cm. long, 3–4.5 mm. broad, mostly rigidly erect, coriaceous, linear-ligulate, obtuse to apiculate and unequally bilobate apically, pseudopetiolate basally and articulate there, the basal sheathing portion about 6 mm. long and 3–3.5 mm. broad, scarious, conduplicate. Inflorescence 5 cm. long, lateral, erect, the tip sharply reflexed, mostly secund, apical portion racemose. Floral bracts mostly erect, 5 mm. long, less than 1 mm. broad at base, linear-ensiform, long-acuminate, the apex rather tortuose. Pedicellate ovaries vaguely arcuate, 1.25 mm. long. Flowers 1 mm. long, "translucent green" [*fide* collector], numerous, fragile in texture. Dorsal sepal ovate, acumin-

ate, 1 mm. long, 0.25 mm. broad. Lateral sepals ovate-elliptic to obovate, acuminate, 1 mm. long, about 0.5 mm. broad, minutely coherent basally, forming a blunt mentum about 0.5 mm. long. Petals ovate, acute-acuminate, slightly upcurving, 0.25 mm. long, much less broad. Lip 1.25 mm. long, about 0.75 mm. broad when expanded, obscurely trilobulate, oblong-elliptic, somewhat bluntly apiculate, with a single median thickening on the disc.

Mt. Tolotom, 1,700 ft. alt.: on trunk of fallen hardwood, epiphytic. Flower translucent green. August, 1950, *P. A. Adams* 2, TYPE, deposited in the Herbarium of the University of California at Berkeley (916891). Living material is being grown in the collections of the Botanical Garden of the University of California at Berkeley.

Phreatia Goodspeediana is an unusual cluster-forming dwarf epiphyte of singular beauty. Its closest alliance is apparently with the Ponapean *P. pseudo-Thompsonii* Tuyama, though it differs from that species in its somewhat smaller size, the second inflorescence, smaller flowers of a green instead of white color, the segments of which are of different shape. It is with pleasure that I dedicate this attractive novelty to Dr. T. Harper Goodspeed, Professor of Botany and Director of the Botanical Garden of the University of California at Berkeley, through whose efforts and kindness the present collection of Ponapean Orchidaceae came into my hands.

Phreatia ladronica Tuyama, Bot. Mag. [Tokyo] 54: 277, 279, in clavi, 1940.

Mt. Sankaku, 1,100 ft. alt.: on tree trunks, with lichens, #27 (*Oberonia Hosokawae* Fukuyama), #24 (*Bulbophyllum Gibbonianum* Schltr.), and Bird's Nest Ferns (*Asplenium nidus* L.). Flower translucent green, epiphytic. August, 1950, *P. A. Adams* 26.

An unusually interesting species, the foliage of which, upon drying, becomes almost

transparent. It was originally described from material collected on Mt. Tappoty, on the island of Saipan, in the Marianas group. Our present specimen, of which living material is being grown in our Botanical Garden, differs slightly in dimensions and in the green instead of white flowers.

PSEUDERIA Schlechter

In Fedde, *Repert. Spec. Nov.*, Beihefte 1: 644, 1914.

Only a single species of this interesting and difficult genus is at present known from the Carolines. The type material was collected by Ledermann near Patapat (=Potopot) on Ponape in 1913; he also obtained additional specimens near Paue (=Poaipoai), on the same island. The species is known also from Babelthuap in the Palau group.

Pseuderia micronesiaca Schltr., *Engl. Bot. Jahrb.* 56: 473, 1920.

Mt. Kubersoh, 2,000 ft. alt.: on mossy tree trunks. Flowers pale green with brownish spots. This plant is common throughout the higher mountains, sometimes almost completely covering a whole tree. Base of stem always rooted in ground. August, 1950, *P. A. Adams* 20. The species is most closely allied with *Pseuderia frutex* Schltr., of New Guinea.

STERILE MATERIAL

Forty-five minutes up trail from Nanpil to Tolenkiup: on fallen tree. Abundant in primary forest from 1,000 ft. alt. (more or less) up. Flower not seen. August, 1950, *P. A. Adams* 8.

This plant, of which only a very fragmentary specimen is present in the collection, is probably referable to one of the sarcanthad genera (subtribe *Sarcanthinae*) which occur in these islands, viz., *Chiloschista* Ldl., *Thrixspermum* Lour., *Luisia* Gaud., *Vandopsis* Pfitz., *Trichoglottis* Bl., *Robiquetia* Gaud., *Saccolabium* Bl., or *Sarcanthus* Ldl.

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